

AMENDMENTS TO THE SPECIFICATION

Please amend the paragraph on page 2, line 11, to line 25, as follows:

That is, the present invention provides a cleaning member comprising: a cylindrical cleaning element having an axial through-hole formed therein; and a rotary shaft held in the through-hole with a press-fit; ~~the~~. The cylindrical cleaning element ~~is being~~ capable of being in either a wet state or a dry state; ~~wherein when~~. When the cylindrical cleaning element is separated from the rotary shaft, the through-hole of the cylindrical cleaning element in a wet state has a diameter smaller than a shaft diameter of the rotary shaft and is capable of being enlarged; ~~and the~~. The cylindrical cleaning element in a dry state is capable of being set in a form such that the through-hole is enlarged; ~~and wherein the~~. The press-fit of the rotary shaft in the through-hole of the cylindrical cleaning element is performed when the cylindrical cleaning element is in a wet state.

Please amend the paragraph on page 2, line 26, to page 3, line 11, as follows:

This cleaning member is produced by a method comprising: preparing the above-mentioned rotary shaft and cylindrical cleaning element; wetting the cylindrical cleaning element; enlarging the through-hole of the wet cylindrical cleaning element so that it has a diameter larger than the diameter of the rotary shaft; dry-setting the enlarged cylindrical cleaning element; inserting the rotary shaft into the through-hole of the dry-set cylindrical cleaning element; and wetting the cylindrical cleaning element into which the rotary shaft has been inserted; to thereby contract the diameter of the through-hole of the cylindrical cleaning element and provide a press-fit between the cylindrical cleaning element and the rotary shaft.

Please amend the paragraph on page 3, line 12, to line 23, as follows:

In this method, in order to enlarge the diameter of the cylindrical cleaning element, use is made of a tool for enlarging a diameter of a cylindrical cleaning element; ~~which~~. The tool comprises: a cylindrical segmented core rod having an axial through-hole formed therein and capable of being diametrically enlarged or contracted; ~~the~~. The segmented core rod in a contracted state ~~has~~ having a diameter smaller than a predetermined diameter of the cylindrical cleaning element in a wet state;

and a. A diameter-enlarging element is adapted to be inserted into the through-hole of the segmented core rod; so as to enlarge a diameter of the segmented core rod to a diameter larger than the outer diameter of the rotary shaft.

Please amend the paragraph on page 4, line 4, to line 9, as follows:

Fig. 1(b) is a cross-sectional view of the cylindrical cleaning element before being attached to the rotary shaft, wherein a left-side portion indicates the cylindrical cleaning element in a wet state; and a right-side portion indicates the cylindrical cleaning element in a dry state.

Please amend the paragraph on page 4, line 27, to page 5, line 1, as follows:

Fig. 4 is a perspective view of a scrub cleaning apparatus for cleaning a wafer; to which the cleaning member of the present invention is attached.

Please amend the paragraph on page 5, line 5, to line 23, as follows:

Fig. 1(a) is a cleaning member according to an embodiment of the present invention; which is used in a scrub cleaning apparatus. As shown in Fig. 1(a), a cleaning member 10 comprises a cylindrical cleaning element 21 made of sponge and having an axial through-hole formed therein; and a rotary shaft 11 having a circular cross-section and held in the through-hole of the cylindrical cleaning element 21 with a press-fit. Opposite ends of the rotary shaft 11 protrude from the cylindrical cleaning element 21. One [on a right side in Fig. 1(a)] of the opposite ends of the rotary shaft 11 is formed with a flange 12 so that one end of the cylindrical cleaning element 21 abuts against the flange 12. In this embodiment, the flange 12 has a smaller outer diameter than the cylindrical cleaning element 21. The other end 13 [on a left side in Fig. 1(a)] of the rotary shaft 11 includes a threaded portion. This threaded portion is connected with a nut 14 so that an end face of the nut 14 abuts against the other end 13 of the cylindrical cleaning element 21.

Please amend the paragraph on page 9, line 10, to line 26, as follows:

An entire length L_2 of the segmented core rod 31 is equal to or larger than an entire length L_1 of the cylindrical cleaning element 21 ($L_1 \leq L_2$). A length L_3 between the distal end (or the inner end) and a base end (or the root portion) of each of the diameter-enlarging elements 32a and 32b is set to be equal to or smaller than a half the length L_2 ($L_3 \leq L_2/2$). The base end of each of the diameter-enlarging elements 32a and 32b is formed with a flange. When the diameter-enlarging elements 32a and 32b are inserted up to their root portions into the segmented core rod 31, the flanges abut against opposite end faces of the segmented core rod 31. Thus, when the diameter-enlarging elements 32a and 32b are inserted into the segmented core rod 31, the flanges abut against the end faces of the segmented core rod 31 and an outer diameter of the segmented core rod 31 automatically becomes the diameter D_2 .

Please amend the paragraph on page 15, line 13, to page 16, line 17, as follows:

In a clean room, the cylindrical cleaning element 21b after purifying, enlarging and dry-setting in the above-mentioned manner may be vacuum-packaged in a powder-free polyethylene bag which generates no dust or clean-packaged in a powder-free polyethylene bag charged with high-purity nitrogen containing no dust. The cylindrical cleaning element 21b may be double-packaged by enclosing the vacuum package or the clean package in a powder-free polyethylene bag. In this arrangement, the dry cylindrical cleaning element delivered from the clean room is separated from an outermost package just before being brought into a clean room for producing semiconductors, in which a cleaning apparatus such as that shown in Fig. 4 is provided, and the vacuum package or the clean package is removed just before the cylindrical cleaning element is attached to the cleaning apparatus. Thus, the cylindrical cleaning element 21b produced under clean conditions in the clean room is fitted onto the rotary shaft 11 to assemble the cleaning member 10; without being contaminated due to exposure to outside air. Super-high-purity water is fed from the cleaning liquid nozzle 43 to the cleaning member 10 attached to the cleaning apparatus; to thereby return the cylindrical cleaning element 21 to a wet state. A clean semiconductor wafer is loaded on the cleaning apparatus and an operation of the cleaning apparatus is started. In order to increase a cleaning ability

of the cylindrical cleaning element 21 in a wet state to a sufficient level, an initializing cleaning operation may be conducted. When the cylindrical cleaning element 21 is preliminarily purified in a wet state before drying, and then clean-packaged, the cylindrical cleaning element 21 is extremely clean and the initializing cleaning operation can be conducted for a short period of time.

Please amend the paragraph on page 17, line 8, to page 18, line 1, as follows:

The cylindrical cleaning element 21 provides a press-fit on the rotary shaft 11. During cleaning, a relative sliding motion between the rotary shaft 11 and the cylindrical cleaning element 21 due to a rotation moment acting on the cylindrical cleaning element 21, which is caused by friction between the cylindrical cleaning element 21 and the substrate W, can be prevented. Further, in order to prevent a sliding motion between the rotary shaft 11 and the cylindrical cleaning element 21 during cleaning, the rotary shaft 11 is knurled so as to form narrow grooves in a surface thereof, so that the sliding motion is suppressed more effectively. By using the cylindrical cleaning element 21b described above, the cylindrical cleaning element can be easily attached to the rotary shaft 11 on which knurls are formed. Further, by using the cylindrical cleaning element 21b, the interference between the cylindrical cleaning element and the knurled rotary shaft can be sufficiently obtained; so that a sliding motion between the cylindrical cleaning element 21 and the rotary shaft 11 during cleaning can be suppressed and, therefore, twisting of the cylindrical cleaning element 21 can be minimized.